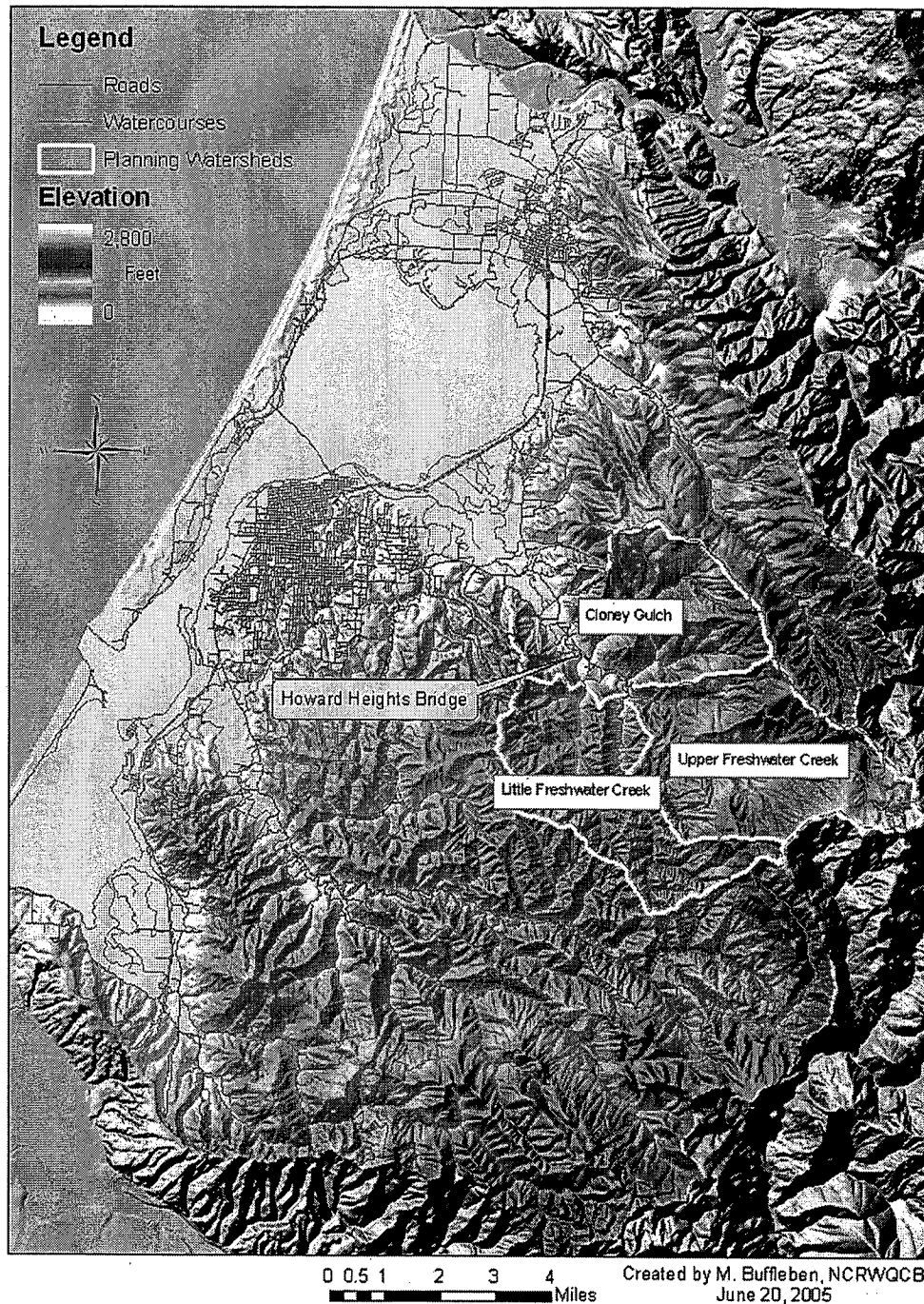
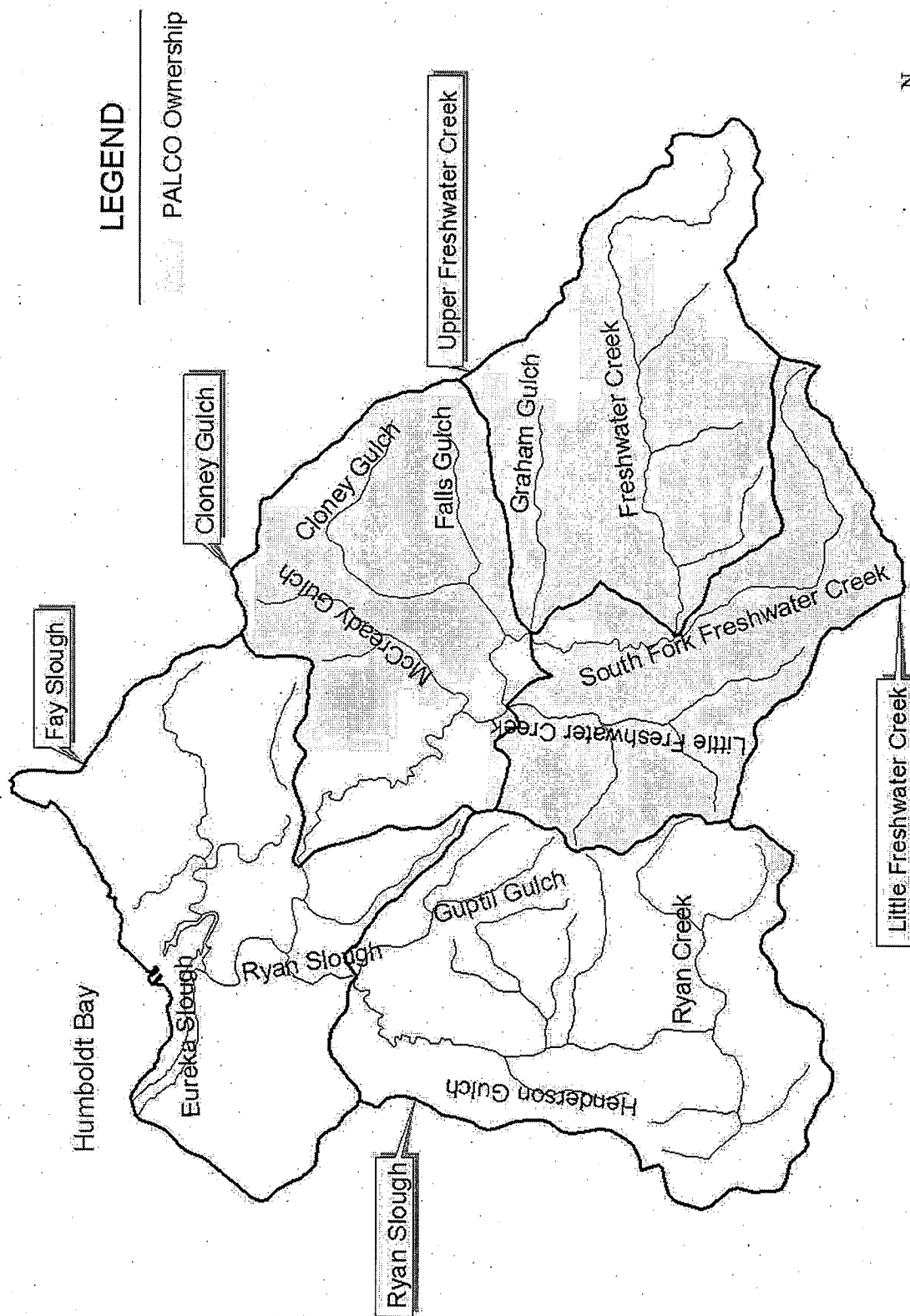


Attachment A-1

Map of Freshwater Creek and planning watersheds, Humboldt County, California



Attachment A-2 Freshwater Creek Planning Watersheds and Ownership Boundaries



**Empirical Peak Flow Reduction Model for the
Watershed-wide Waste Discharge Requirements for Elk River
and Freshwater Creek, Humboldt County, California**



September 2, 2005

California Regional Water Quality Control Board
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, CA 95403

Landslide Reduction Model for WWDRs
in Elk River and Freshwater Creek

Attachment C

Empirical Harvest-Related Landslide Sediment Delivery Reduction Model

Prepared By

**Staff of the North Coast
Regional Water Quality Control Board
September 2, 2005**

California Regional Water Quality Control Board
North Coast Region

Monitoring and Reporting Program No. R1-2008-0071
(Revised July 9, 2008)

for

THE PACIFIC LUMBER COMPANY,
SCOTIA PACIFIC COMPANY LLC,
AND SALMON CREEK CORPORATION

P.O. Box 37
Scotia, CA 95565

ELK RIVER and FRESHWATER CREEK WATERSHEDS
Humboldt County

This Monitoring and Reporting Program (MRP) is issued pursuant to California Water Code section 13267(b) and is associated with the Watershed-wide Waste Discharge Requirements (hereinafter referred to as "WWDRs") Order No. R1-2006-0039 and Order No. R1-2006-0041, for Elk River and Freshwater Creek watersheds, respectively. The WWDRs are issued to the Pacific Lumber Company, Scotia Pacific Company LLC, and Salmon Creek Corporation (hereinafter "Discharger"). The reasons for requiring this information from the Discharger and the evidence supporting this requirement can be found in the related findings adopted with the WWDRs in Resolution No. R1-2006-0038 and Resolution No. R1-2006-0040.

The WWDRs establish receiving water limitations on peak flow and sediment delivery from harvest-related landsliding. Compliance with these receiving water limitations is derived using mathematical models (the "Peak Flow Model" and "Landslide Reduction Model"), which describe how landsliding and peak flow are affected by rate of timber harvest. Each model produces an allowable annual harvest level. In cases where the models specify different harvest rates for a particular area, the more restrictive rate applies. In the event that the harvest rate from the Landslide Reduction Model is limiting, the WWDRs do allow the Discharger to exceed that rate (up to the limit specified by the Peak Flow model) provided that there is zero discharge of sediment from harvest-related landslides from the additional harvested acres and that a monitoring program to prove no such discharge has occurred has been approved by the Executive Officer. The Discharger terms these additional acres of harvest area "Tier 2" acres.

The Discharger has prepared a "THP Unit Review for Tier 2 Enrollment" and Quality Assurance Project Plans for "Acreage Enrollment and Compliance Monitoring" and "Harvest-related Landslide Monitoring Plan." These plans describe the measures to be taken in preparing timber harvest plans (THPs) for enrollment under "Tier 2", the protocols for enrollment and tracking of acreages under "Tier 2", and the procedures and protocols for monitoring landslides as required by Order No. R1-2006-0039 and Order No. R1-2006-0041 for Elk River and Freshwater Creek, respectively.

Reference to those plans and their inclusion herein constitutes written approval of the monitoring plan by the Regional Water Board Executive Officer as required by the WWDRs. Its implementation is ordered by the Executive Officer through this Monitoring and Reporting Program.

This Order in no way limits the authority of the Regional Water Board Executive Officer to require the Discharger to conduct additional investigation, monitoring, and reporting consistent with the California Water Code. This Order may be revised by the Executive Officer as additional information becomes available. This Order may also be revoked by the Executive Officer upon determining that the approved monitoring program is insufficient to ensure ongoing compliance with the zero discharge prohibition for discharges of sediment from harvest-related landslides to waters of the state.

The information required by this Order is necessary to ensure the ongoing compliance of the Discharger with the zero discharge prohibition for discharges of sediment from harvest-related landslides to waters of the state. As documented in the WWDRs and in the supporting administrative record, timber harvest activities in the Freshwater and Elk River watersheds have historically caused landslides that have discharged sediment to waters of the state. These discharges have resulted in impacts on beneficial uses because they have reduced watercourse capacity and have degraded the quality of surface waters. Unlike other THPs covered by the WWDRs, "Tier 2" THPs are prohibited from causing any discharge of sediment from harvest-related landslides to waters of the state. Gauging the potential risk of landslides on individual THPs is a complex task, requiring specialized information about site-specific conditions. Landslide prevention requires onsite assessment to identify incipient landslides following triggering events. More detailed information is available in the Regional Water Board's public file on this matter.

Under the authority of the California Water Code section 13267(b), the Discharger named above is required to comply with the following:

A) Objectives

- 1) The objective of the program is to:
 - a) provide an enforceable monitoring plan to ensure that no discharge has occurred from harvest-related landslides occurring in and downslope of the THP units enrolled as "Tier 2" areas of the WWDRs
 - b) notify the EO of a landslide on a Tier 2 harvest area and/or appurtenant road in a timely fashion such that a corrective response is made to address any discharge, or if no discharge has occurred, to prevent a discharge, and
 - c) establish a method of preharvest planning that minimizes, to the greatest extent possible, the risk of harvest-related landsliding.
- 2) For the purposes of this order, "landslides" shall be defined as the downslope movement, under gravity, of masses of soil and rock material. More specifically, the focus is shallow debris sliding, formed by translational movement of soil and rock material, usually shallow in nature, along a planar or undulating surface of rupture.

B) Timing of Applications, Approval, and Commencement of Timber Harvest Operations

- 1) Applications for "Tier 2" enrollments shall not be accepted after September 15 of each year. Enrollments shall not be made after November 1 of each year.
- 2) The Executive Officer shall notify the discharger of enrollment within 45 days of submittal of a complete application. If no notification occurs, the project will be deemed not eligible for enrollment.
- 3) An updated Erosion Control Plan, with items highlighted that are specific to the "Tier 2" unit being enrolled, shall be included in the "Tier 2" application package.

- 4) No felling of timber on an approved "Tier 2" unit shall occur until the required May 1 annual report (see below) has been submitted, and verifies that there was no sediment discharge from a harvest-related landslide to a watercourse from any previously-harvested "Tier 2" units.

C) Public Process

- 1) When the Regional Water Board has received an application for "Tier 2" enrollments and is in the process of evaluation, the project description of the proposed enrollment shall be posted on the Regional Water Board website. An Internet listserver will email notifications to all subscribers of the availability of review documents in our office. Application materials, including maps and an Erosion Control Plan with items highlighted that are specific to the "Tier 2" unit and appurtenant roads, will be available for review at the Regional Water Board office in Santa Rosa and on the Regional Water Board website.

Interested persons are encouraged to review the application and submit comments. Comments should focus on the factors described in the "Tier 2" Review document (Appendix A). Staff will consider all comments received during a 14-day comment period that begins on the first date of posting. Regional Water Board staff may or may not provide responses to comments. New substantive comments on specific "Tier 2" applications will be discussed with the Discharger and commenter.

- 2) After the 14 day period, and after any substantive issues raised by public comments or internal review have been resolved, the Executive Officer may grant coverage, and the THP unit will become enrolled under Order No. R1-2006-0039 or Order No. R1-2006-0041 for Elk River or Freshwater Creek, respectively.

D) "Tier 2" Acreage Landslide Field Inspection

Following harvest of a THP unit enrolled under "Tier 2", the unit will receive, at a minimum, two (2) hillslope investigations each year to search for new landslides or enlargement of existing landslides during the winter season. Regional Water Board staff may be present during inspections.

- 1) This hillslope assessment will be performed according to PALCO Watershed Operating Protocol No. 11 (WOP-11): "Hillslope Sediment Source Inspection."
- 2) The Discharger will traverse the area within and downslope of each THP unit enrolled in "Tier 2" to determine whether new landslides have occurred or existing landslides within or downslope of these units have reactivated, based on maps produced during the initial geologic investigation included in the THP. The assessment also includes walking the boundary between watercourses and harvest units to identify discharges of landslide sediment.
- 3) During the assessment, field inspectors will record any sediment source (not just landslides), regardless of size, that is delivering or in a position to discharge to a watercourse. Discharger must notify the Executive Officer of any discharges within 48 hours of discovery. The existence of any new landslide, or enlargement or reactivation of an existing landslide will trigger cessation of harvest.
- 4) Follow-up assessments with the Discharger, California Geological Survey, Regional Water Board staff, and other agencies as needed will determine whether the identified landslide is harvest-related. Discharger's protocol WOP 08 may be used as a guidance document for the assessment.

E) Timing of Inspections

- 1) Each THP unit enrolled in "Tier 2" will receive several hillslope inspections in accordance with the Discharger's WOP-11.
 - a) The first inspection will occur prior to harvest to document any existing landslides that were not identified in the THP documentation.
 - b) The second inspection will occur upon completion of harvest activities. This inspection also will ensure that the THP unit has been properly treated for winter storms.
 - c) Storm-related inspections following significant rainfall events as described below.
 - (1) Inspection-triggering Rainfall
 - (a) 2 inches in a 24-hour period, following 10 inches of cumulative rainfall beginning October 1 of each year, and/or
 - (b) 1 inch in a 6-hour period, regardless of cumulative rainfall.
 - (c) Even if no events meet the storm-related inspection criteria by April 1 of each hydrologic year (October 1 – September 1), an inspection shall be performed by April 4 of that hydrologic year.
 - (2) In addition to the above situations, inspections shall be performed
 - (a) upon discovery of a landslide on or below a "Tier 2" THP unit,
 - (b) when the Executive Officer determines one is warranted, or
 - (c) when post-storm road and landscape surveys reveal that the two watersheds have suffered a combined total of 10 or more landslides, it will be assumed that a triggering event has occurred, and an inspection will be conducted for every THP unit enrolled under "Tier 2."
- F) Earthquake Triggering Events
 - 1) The defining criterion for a significant earthquake is based on magnitude and distance of the epicenter from the watershed referencing Curve A in Figure 1 from Keefer (1984).
 - 2) An inspection will be made following a significant earthquake, which will look for cracks and other signs of potential failure as well as actual landslides within the area that lies within the radius centered over the epicenter defined by the maximum distance for the earthquake magnitude.
- G) Notifications

If a landslide is observed either during an inspection or at any other time, or if there is evidence of an incipient landslide, the Discharger shall notify the Executive Officer by phone within 48 hours and in writing within 10 days. Notification shall include a description of the landslide, an estimate of the volume of the zone of depletion, an estimate of any sediment delivery, observations regarding impacts to the stream and/or stream corridor, any causative factors, and corrective actions taken to abate any discharges and stabilize the landslide.
- H) Corrective Action
 - 1) If a new landslide or a reactivated landslide is identified during any of the inspection processes, the Discharger will cease all operations on "Tier 2" acres.
 - 2) The Discharger will cooperate with the Regional Water Board staff in investigations to determine landslide cause and delivery, and potential remediation operations. There will be no further enrollments under "Tier 2" pending the completion of the investigation.
- I) Compilation of Inspection Results

- 1) An annual report summarizing monitoring activities and results for the calendar year is due to be received by the Executive Officer no later than May 1 of the following calendar year.
 - 2) The annual Harvest-Related Landslide Monitoring Report shall contain:
 - (a) Introduction describing the purpose and objectives of the monitoring
 - (b) Rainfall Record (daily rainfall amounts, tabular and graphic displays)
 - (c) Hillslope inspection results
 - (d) Inspection activity logs
 - (e) Notifications
 - (f) Corrective actions
 - (g) Problems encountered and resolution, and
 - (h) Potential modifications to the process.
- J) Quality Assurance and Quality Control Project Plans (QAPPs)
- 1) The Discharger has developed a QAPP ("Harvest-related Landslide Monitoring Plan for Tier 2 Enrolled Acres--Elk River and Freshwater Creek") for the monitoring and reporting activities under "Tier 2". The QAPP was revised, based on comments from Regional Water Board staff, to harmonize with this program and address all aspects of the monitoring program. It contains:
 - a) Standard procedures for the establishment of repeatable sampling locations;
 - b) Standard operating procedures for each field method and piece of equipment used;
 - c) Standard operating procedures for each laboratory method and piece of equipment used;
 - d) Standard operating procedures;
 - e) Measures for quality assurance associated with monitoring and reporting procedures;
 - f) Measures for quality control associated with monitoring and reporting procedures;
 - g) A training program for personnel conducting monitoring activities; and
 - h) Measures for adapting the QAPP, when necessary.
 - 2) The Discharger may propose changes to the procedures and control measures specified in the QAPP as necessary, and submit the changes to the Executive Officer for approval. Following approval of changes to the QAPP, the Discharger shall document such changes and implement the new procedures and control measures immediately.
- K) Work Conducted by Licensed Professionals
- The practice of geology is identified and regulated under Chapter 12.5 (Geologists and Geophysicists Act) of the Business and Professions (B&P) Code, including Rules and Regulations (CCR Title 16, Division 29) and any related sections of the B&P Code, Government Code, Penal Code, and/or Evidence Code. The practice of engineering in California is identified and regulated under Chapter 7 (Professional Engineers Act) of the B&P Code, including rules and regulations (CCR Title 16, Division 5) and any related sections of the B&P Code, Government Code, Penal Code, and/or Evidence Code. The Discharger shall fully comply with all aspects of existing statutes and regulations regarding the practice of geology and/or engineering while satisfying the Terms and Provisions of this Order.
- L) Signatory Requirements
- All required technical reports, inspection reports, certifications, and other reports prepared in accordance with the Terms and Provisions of this Order submitted to the

Regional Water Board shall be signed by the Discharger or the Discharger's duly authorized representative(s). All persons signing a document under this provision shall make the following certification:

"I hereby certify, in accordance with North Coast Regional Water Quality Control Board (NCRWQCB) Order Nos. RI-2006-0039 and RI-2006-0041, that the attached application and the description of THP modifications; and the materials submitted along with it:

- a) are in accordance with accepted engineering practices, and recognized professional standards;
- b) comply with the requirements of the Monitoring and Reporting Program No. R1-2008-0071, approved by the Executive Officer of the North Coast Regional Water Quality Control Board; and
- c) provided that the THP is properly implemented, operated, and maintained, are adequate for the THP to meet the applicable Zero Delivery of landslide related sediment performance standards of NCRWQCB Orders R1-2006-0039, R1-2006-0041, and R1-2008-0071, insofar as such performance can reasonably be predicted by accepted engineering geologic practices.

The opinions presented in the subject THP have been developed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable engineering geologists practicing in this or similar localities."

- M) Failure to comply with the terms of this Order can result in civil liabilities of up to \$5,000 per day under Water Code section 13268(a)(b)&(d)(1), or misdemeanor prosecution under Water Code section 13268(c)&(d)(2).
- N) Any person affected by this action of the Regional Water Board may petition the State Water Resources Control Board (State Water Board) to review the action in accordance with Section 13320 of the California Water Code and Title 23, California Code of Regulations, Section 2050. The petition must be received by the State Water Board within 30 days of the date of this Order. Copies of the law and regulations applicable to filing petitions will be provided upon request. In addition to filing a petition with the State Water Board, any person affected by this Order may request the Regional Water Board to reconsider this Order. To be timely, such request must be made within 30 days of the date of this Order. Note that even if reconsideration by the Regional Water Board is sought, filing a petition with the State Water Board within the 30-day period is necessary to preserve the petitioner's legal rights. If you choose to appeal this Order, be advised that you must comply with this Order while your appeal is being considered.

Ordered by:

Catherine Kuhlman
Executive Officer

July 9, 2008